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Maritimes Region

Canadian Science Advisory Secretariat
Science Response 2015/024

ASSESSMENT UPDATE OF BROWNS BANK NORTH SCALLOPS (*PLACOPECTEN MAGELLANICUS*)

Context

The purpose of this report is to update the key results from the last assessment with data from 2014 in order to provide science advice for the management of the 2015 fishery. The last full assessment of this stock was in 2013 (DFO 2013, Hubley et al. 2013), and an update was conducted in 2014 (DFO 2014).

The management of the main Scallop fishery on Browns Bank refers to the northern part of the bank. Browns Bank South is a marginal growth area for Scallops and has separate management measures (Appendix 1). The assessment and advice presented in this document use the assessment framework established in 2011 (Hubley et al. 2011) for Browns Bank North.

This Science Response report results from the Science Response Process of April 1, 2015, on the Stock Status Update of Offshore Scallop in Scallop Fishing Areas (SFA) 25-27.

Analysis and Response

The 2014 total allowable catch (TAC) was 750 t for Browns Bank North and total reported landings were 747 t (Figure 1). Based upon preliminary analysis of the 2014 fishery data and the annual stock survey data, an interim TAC of 750 t was set for the 2015 Browns Bank North fishery.

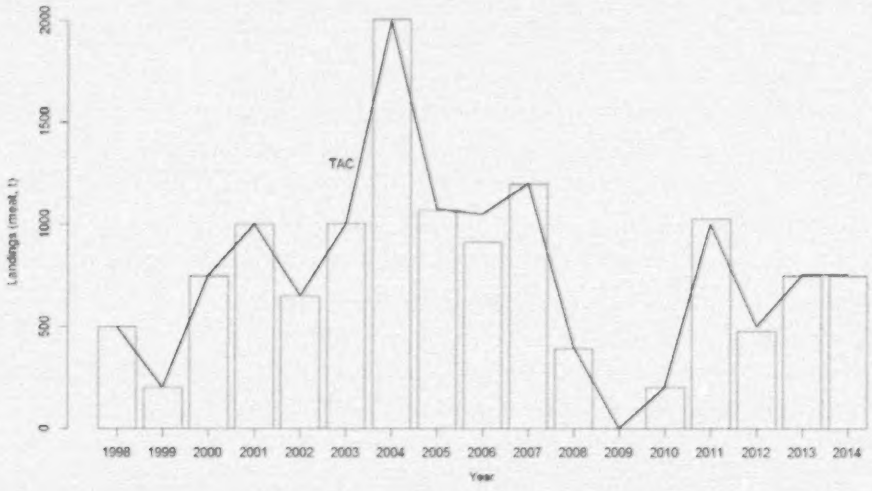

Figure 1. Landings of Scallop meats (metric tons) from Browns Bank North from 1998 to 2014. Solid line represents total allowable catch (TAC), in metric tons. Prior to 1998, landings from Browns Bank North were combined with Browns Bank South.

Science advice is provided for this stock using a Bayesian state-space assessment model that integrates both fishery and survey data and is described in Hubley et al. (2013). Estimates of fully-

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recruited biomass in 2014 and projections of fully-recruited biomass for 2015 under various catch scenarios are presented for this stock.

Fully-recruited biomass, estimated to be 5,374 t in 2014, is slightly below the 2013 estimate (5,804 t), and the 23-year median biomass of 5,820 t (Figure 2). Recruit biomass is estimated to be 306 t in 2014, an increase from the 2013 estimate (205 t), and below the 23-year median biomass of 582 t. The model's forecast for fully-recruited biomass in 2015 is 5,363 t; this assumes a catch of 750 t (the interim TAC), condition the same as 2014 (12.5 g/dm^3), and natural mortality rates the same as 2014. The projected biomass represents little change from 2014 (Figure 2). Reference points have been proposed for the fishery (DFO 2012) but have not yet been adopted.

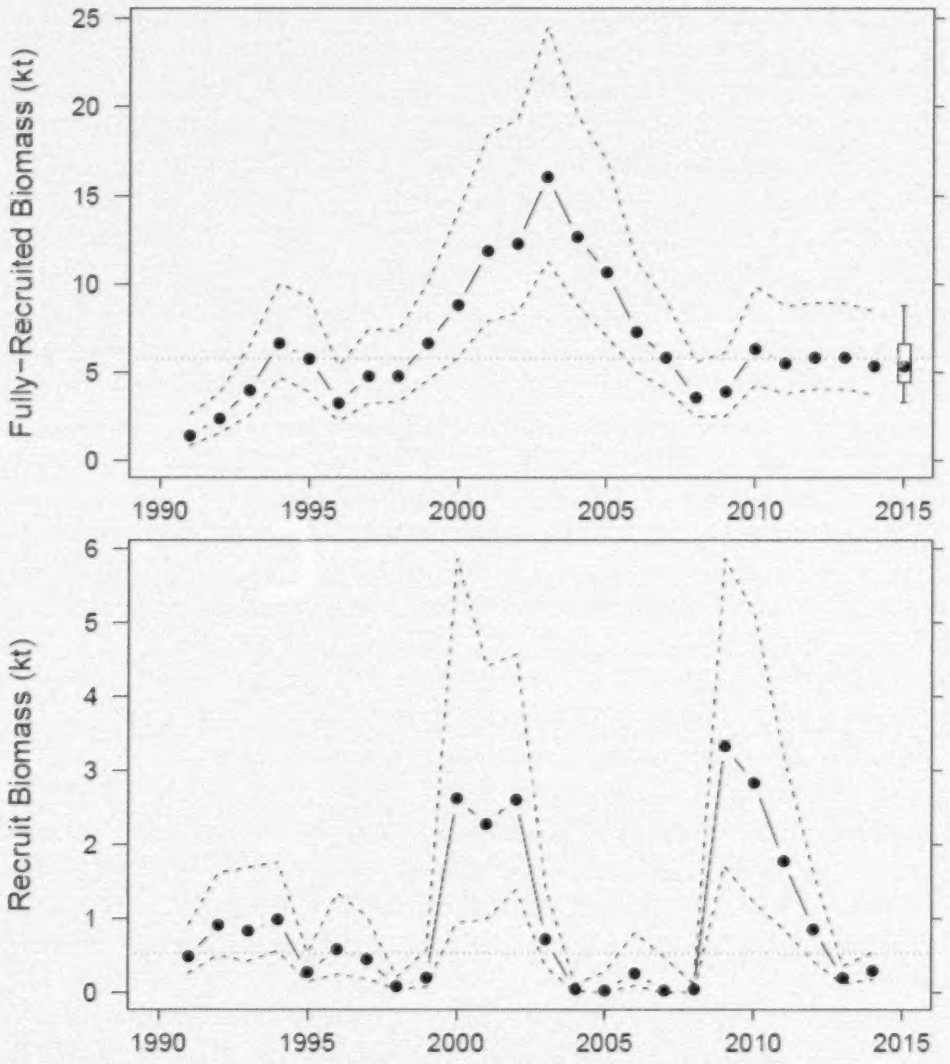

Figure 2. Biomass estimates for fully-recruited (top panel) and recruit (lower panel) scallops from the stock assessment model fit to the Browns Bank North survey and commercial data. Dashed lines are the upper and lower 95% credible limits on the estimates. The horizontal dotted line represents the 23 year median (1991-2013). The forecasted fully recruited biomass for 2015, assuming a catch of 750 t, is displayed as a box plot with median (•), 50% credible limits (box) and 80% credible limits (whiskers).

Conclusions

The 2015 interim TAC of 750 t results in an exploitation rate of 0.14 and biomass is expected to remain relatively stable (Table 1). Catch scenarios ranging from 200 t to 1000 t were examined and all had moderate (0.37-0.59) probability of decline in fully-recruited biomass for 2015. Biomass change ranged from 10.3 to -6 % for the range of catches considered (Table 1).

Table 1. Catch scenarios for Browns Bank North in 2015 in terms of exploitation and expected changes in fully-recruited biomass. Potential catches in 2015 are evaluated in terms of the probability of a decline in biomass. These probabilities account for uncertainty in the biomass forecasts.

Catch (t)	Exploitation Rate	Probability of Biomass Decline	Expected Change in Biomass (%)
200	0.05	0.37	10.26
300	0.06	0.39	8.22
400	0.08	0.42	6.25
500	0.10	0.44	4.13
600	0.11	0.47	2.10
700	0.13	0.50	-0.20
750	0.14	0.51	-0.93
800	0.14	0.53	-2.17
900	0.16	0.55	-3.50
1000	0.18	0.59	-6.23

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Sources of Information

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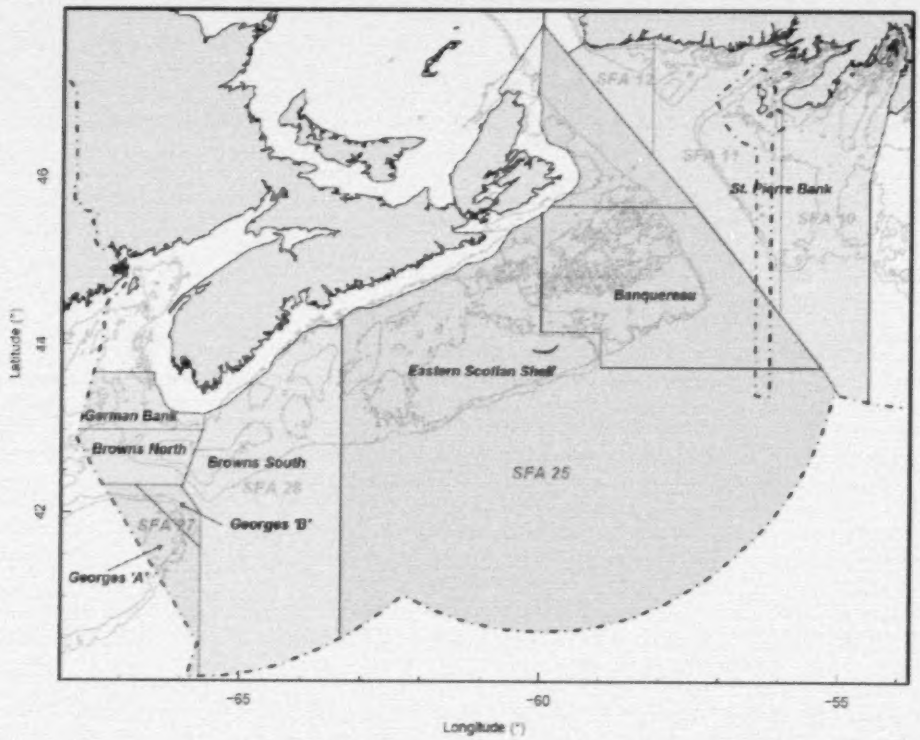
Appendix



Appendix 1. Map showing offshore scallop fishing areas (SFAs) used for management purposes in the Maritimes region. Note the division of Browns Bank North as a subarea of SFA 26.

This Report is Available from the:

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